Osteopathic Lymphatic Pump Techniques

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Lymphatic pumps are gentle passive techniques that may be used on patients in both the inpatient and outpatient clinical settings. Pumps are used to facilitate fluid movement or immune responses in patients with varying symptoms and disease states. Somatic dysfunction affecting lymphatic flow may contribute to edema, impaired clearance of infection, and altered tissue healing and immune responses. In this article, we highlight key points regarding the lymphatic system and the role of lymphatic pump treatment (LPT) in clinical care.

The lymphatic system is a secondary circulatory system composed of a complex network of lymphatic channels, capillaries, nodes, plexes, tissues, and organs. This system serves to maintain homeostasis, support the immune response, and improve fluid balance. It collects and filters fluid and proteins from interstitial tissue and absorbs and transports nutrients.

Lymphatic and venous flow is dependent on local mechanical and fluid forces as well as pressure differentials generated by muscular and diaphragmatic activity throughout the body. Large lymph vessels contain an intrinsic pump in the form of lymphangions, which are under autonomic control (both sympathetic and parasympathetic) and produce a peristaltic wave. A larger-amplitude mechanical pumping is induced by muscle pumps, intrinsic visceral motion, and the rhythmic nature of respiration. Breathing generates a pumping action as lymph and venous blood are drawn into the negatively pressured thoracic cavity from the positively pressured abdominal cavity during inhalation. However, somatic dysfunction may impede lymphatic flow via fascial compression of lymphatic vessels, increased impedance in the thoracic inlet region (the terminal drainage point), and increased sympathetic tone, which can alter stasis and valve motion.

Thoracic and pedal pump techniques (video) are 2 types of LPT that can be used to enhance the body’s inherent physiologic pumping action. These pumping techniques have been demonstrated to increase lymphatic flow in the thoracic duct, and mechanical pumping has been shown to increase lymph uptake in rats. Furthermore, the application of LPT has been shown to boost antibody responses to vaccines (including pneumococcal and hepatitis B) and significantly increase secretory immunoglobulin A in a stressed population.

Lymphatic pump techniques have also been shown to mobilize leukocytes from gut-associated lymphoid tissue, significantly increase leukocyte count, and mobilize inflammatory mediators such as interleukin 8, interleukin 6, interleukin 10, monocyte chemoattractant protein 1, granulocyte colony-stimulating factor, keratinocyte-derived chemotactant, nitrite, and superoxide dismutase. When compared with levofloxacin plus sham treatment or levofloxacin alone given to rats infected with Streptococcus pneumoniae, the combination of LPT and levofloxacin was found to significantly reduce colony-forming units of S pneumoniae found in the lungs at 72 and 96 hours. In clinical practice, patients treated with the thoracic lymphatic pump after cholecystectomy were found to have an earlier recovery and a faster improvement of forced vital capacity than those treated with incentive spirometry. Lymphatic pump techniques are generally well tolerated; however, there are a few absolute contraindications, including anuria and necrotizing fasciitis. Contraindications are often related to concern regarding lymphatic spread of infection or malignant cells, dislodging a deep vein thrombosis, or causing fluid disbalance in a fluid-overloaded patient. Relative contraindications include treatment localized over an area that has cancer, fracture, or active infection; overwhelming bacterial
or chronic infections; coagulopathies; and unstable congestive heart failure.1,16 It is important to ensure that proximal lymphatic channels are opened before performing these techniques.

Lymphatic pump techniques can be easily and safely used in many patient presentations to enhance lymphatic fluid motion and improve immune function.

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References